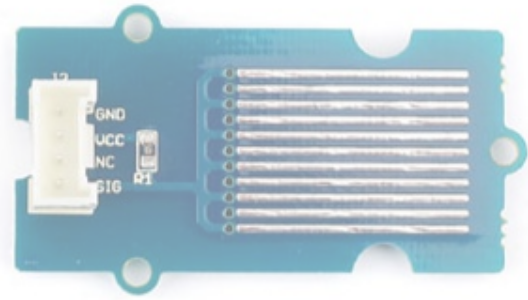


## Grove - Water Sensor



The Water Sensor module is part of the Grove system. It indicates whether the sensor is dry, damp or completely immersed in water by measuring conductivity. The sensor traces have a weak pull-up resistor of 1 M $\Omega$ . The resistor will pull the sensor trace value high until a drop of water shorts the sensor trace to the grounded trace. Believe it or not this circuit will work with the digital I/O pins of your Arduino or you can use it with the analog pins to detect the amount of water induced contact between the grounded and sensor traces.

### Version

Product Version	Changes	Released Date
Grove-Water Sensor V1.1	Initial	July 2014

### Features

- Grove compatible interface
- Low power consumption
- 2.0cm x 2.0cm Grove module
- High sensitivity

### Applications Ideas

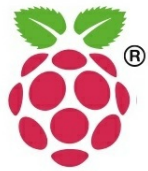
- Rainfall detecting
- Liquid leakage
- Tank overflow detector

### Specifications

Item	Min	Typical	Max	Unit
Working Voltage	4.75	5.0	5.25	V
Current	<20			mA
Working Temperature	10	-	30	°C
Working Humidity (without condensation)	10	-	90	%

Tip  
More details about Grove modules please refer to [Grove System](#)

### Platforms Supported



#### Caution

The platforms mentioned above as supported is/are an indication of the module's software or theoretical compatibility. We only provide software library or code examples for Arduino platform in most cases. It is not possible to provide software library / demo code for all possible MCU platforms. Hence, users have to write their own software library.

## Getting Started

#### Note

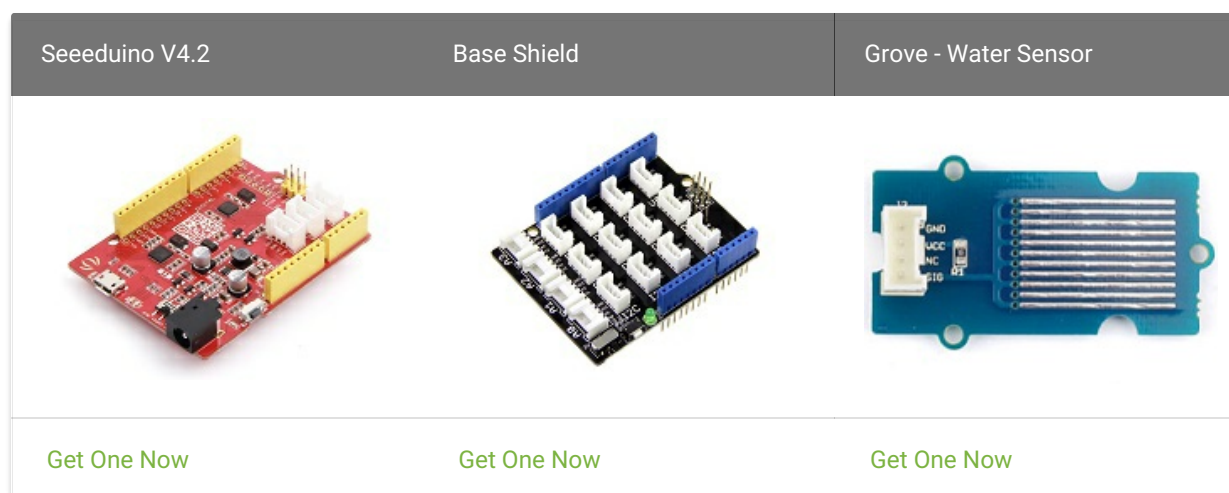
If this is the first time you work with Arduino, we firmly recommend you to see Getting Started with Arduino before the start.

## Play With Arduino

### Hardware

Connect the module to the Basic board using any of the digital pin. You can gain the value of the signal pin. When there is water on the bare conducting wires, the value is LOW. Otherwise, it will be HIGH.

- Step 1. Prepare the below stuffs:



- Step 2. Connect Water Sensor to port D2 of Grove-Base Shield.
- Step 3. Plug Grove - Base Shield into Seeeduino.
- Step 4. Connect Seeeduino to PC via a USB cable.

#### Note

If we don't have Grove Base Shield, We also can directly connect Grove\_Water\_Sensor to Seeeduino as below.

Seeeduino	Grove - Water Sensor
5V	Red
GND	Black
Not Connected	White
D2	Yellow

### Software

- Step 1. Copy the code into Arduino IDE and upload. If you do not know how to upload the code, please check [how to upload code](#).

```
#define WATER_SENSOR 2

void setup()
{
  Serial.begin(9600);
  pinMode(WATER_SENSOR, INPUT);
}

void loop()
{
  Serial.println(digitalRead(WATER_SENSOR));
  delay(500);
}
```

- Step 2. We will see the output display on terminal as below.

1  
1  
0  
0  
1  
1

## Play with Codecraft

### Hardware

Step 1. Connect a Grove - Water Sensor to port D2 of a Base Shield.

Step 2. Plug the Base Shield to your Seeeduino/Arduino.

Step 3. Link Seeeduino/Arduino to your PC via an USB cable.

### Software

Step 1. Open [Codecraft](#), add Arduino support, and drag a main procedure to working area.

#### Note

If this is your first time using Codecraft, see also [Guide for Codecraft using Arduino](#).

Step 2. Drag blocks as picture below or open the cdc file which can be downloaded at the end of this page.



Upload the program to your Arduino/Seeeduino.

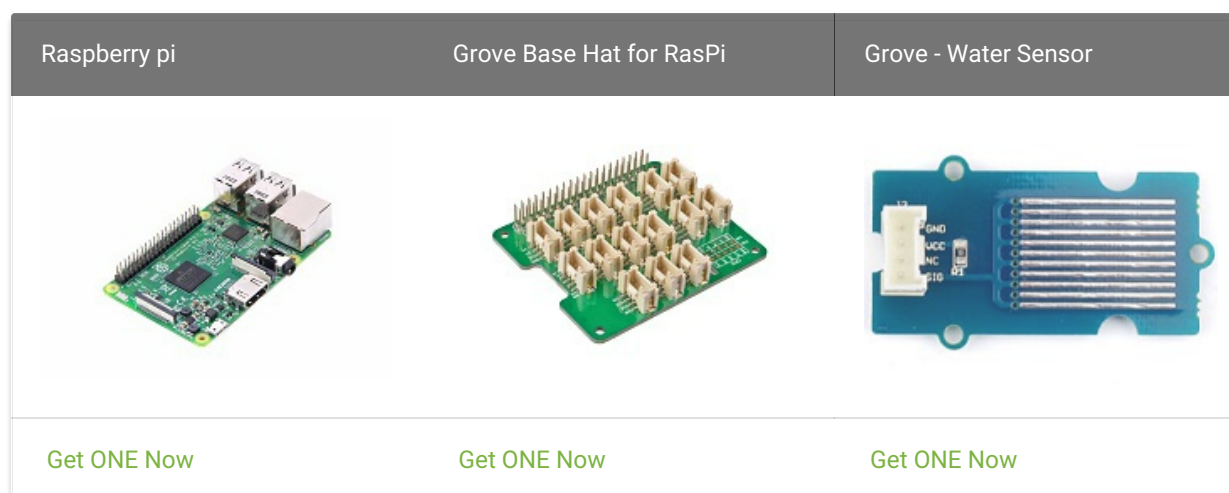
#### Success

When the code finishes uploaded, you will see there is water or not in Serial Monitor.

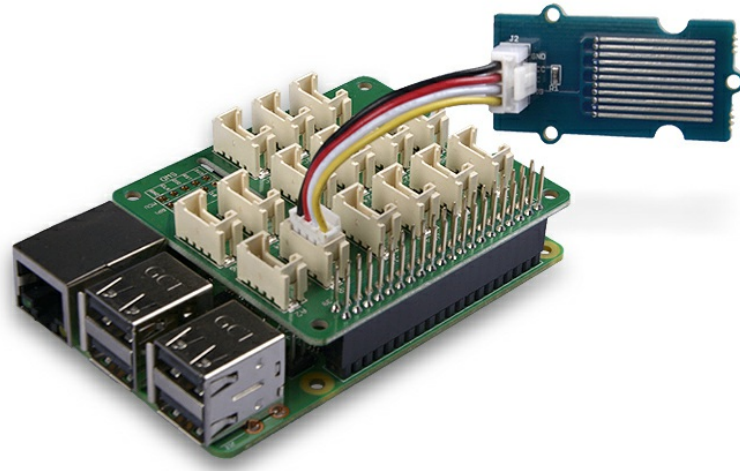
## Play With Raspberry Pi (With Grove Base Hat for Raspberry Pi)

### Hardware

- Step 1. Things used in this project:



- Step 2. Plug the Grove Base Hat into Raspberry Pi.
- Step 3. Connect the Grove - Water Sensor to to the A0 port of the Base Hat.
- Step 4. Connect the Raspberry Pi to PC through USB cable.



## Software

- Step 1. Follow [Setting Software](#) to configure the development environment.
- Step 2. Download the source file by cloning the grove.py library.

```
cd ~
git clone https://github.com/Seeed-Studio/grove.py
```

- Step 3. Execute below command to run the code.

```
cd grove.py/grove
python grove_water_sensor.py 0
```

Following is the grove\_water\_sensor.py code.

```
import math
import sys
import time
from grove.adc import ADC

class GroveWaterSensor:

    def __init__(self, channel):
        self.channel = channel
        self.adc = ADC()

    @property
    def value(self):
        return self.adc.read(self.channel)

Grove = GroveWaterSensor

def main():
    if len(sys.argv) < 2:
        print("Usage: {} adc_channel".format(sys.argv[0]))
        sys.exit(1)

    sensor = GroveWaterSensor(int(sys.argv[1]))

    print('Detecting ...')
    while True:
        value = sensor.value
        if sensor.value > 800:
            print("{} Detected Water.".format(value))
        else:
            print("{} Dry.".format(value))

        time.sleep(1)

if __name__ == '__main__':
    main()
```

Success

If everything goes well, you will be able to see the following result

```
pi@raspberrypi:~/grove.py/grove $ python grove_water_sensor.py 0
Detecting ...
612 Dry.
749 Detected Water.
829 Dry.
357 Dry.
98 Dry.
352 Dry.
517 Dry.
718 Detected Water.
868 Detected Water.
581 Dry.
90 Dry.
326 Dry.
451 Dry.
666 Dry.
867 Detected Water.
684 Dry.
100 Dry.
^CTraceback (most recent call last):
  File "grove_water_sensor.py", line 71, in <module>
    main()
  File "grove_water_sensor.py", line 62, in main
    value = sensor.value
  File "grove_water_sensor.py", line 48, in value
    return self.adc.read(self.channel)
  File "/usr/local/lib/python2.7/dist-packages/grove/adc.py", line 66, in read
    return self.read_register(addr)
  File "/usr/local/lib/python2.7/dist-packages/grove/adc.py", line 84, in read_register
    return self.bus.read_word_data(self.address, n)
  File "/home/pi/.local/lib/python2.7/site-packages/smbus2/smbus2.py", line 396, in re
ad_word_data
    ioctl(self.fd, I2C_SMBUS, msg)
KeyboardInterrupt
```



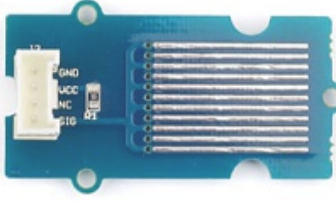
You can use this sensor to detect the water. Press **Ctrl+C** to quit.

**Notice**  
You may have noticed that for the analog port, the silkscreen pin number is something like A1, A0, however in the command we use parameter 0 and 1, just the same as digital port. So please make sure you plug the module into the correct port, otherwise there may be pin conflicts.

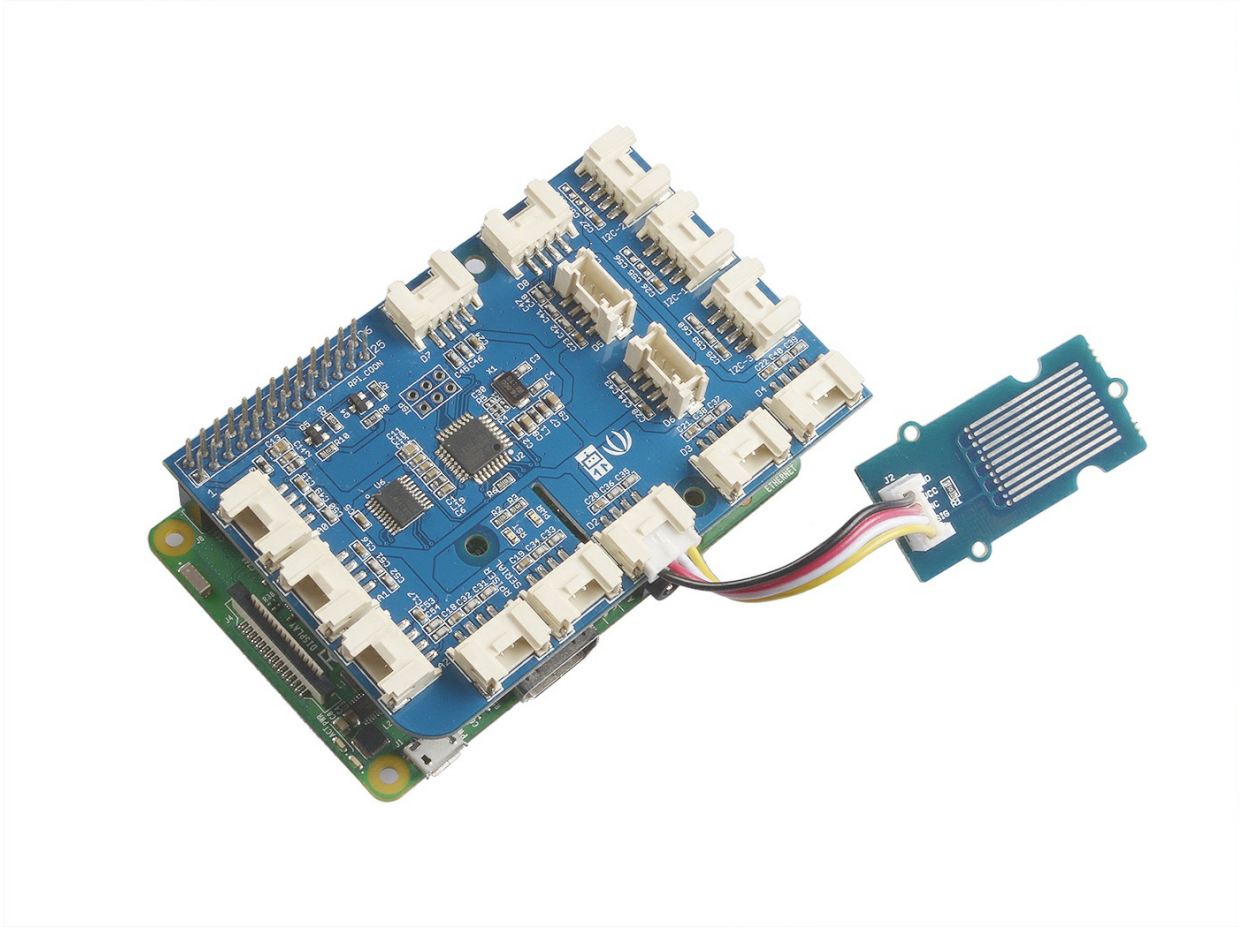
### Play With Raspberry Pi(with GrovePi\_Plus)

#### Hardware

- Step 1. Prepare the below stuffs:

Raspberry pi	GrovePi_Plus	Grove - Water Sensor
		
<a href="#">Get One Now</a>	<a href="#">Get One Now</a>	<a href="#">Get One Now</a>

- Step 2. Plug the GrovePi\_Plus into Raspberry.
- Step 3. Connect Grove-Water Sensor to D2 port of GrovePi\_Plus.
- Step 4. Connect the Raspberry to PC through USB cable.



## Software

- Step 1. Follow [Setting Software](#) to configure the development environment.
- Step 2. Navigate to the demos' directory:

```
cd yourpath/GrovePi/Software/Python/
```

- Step 3. To see the code

```
nano grove_water_sensor.py
```

```
import time
import grovepi

# Connect the Grove Water Sensor to digital port D2
# SIG,NC,VCC,GND
water_sensor = 2

grovepi.pinMode(water_sensor,"INPUT")

while True:
    try:
        print grovepi.digitalRead(water_sensor)
        time.sleep(.5)

    except IOError:
        print "Error"
```

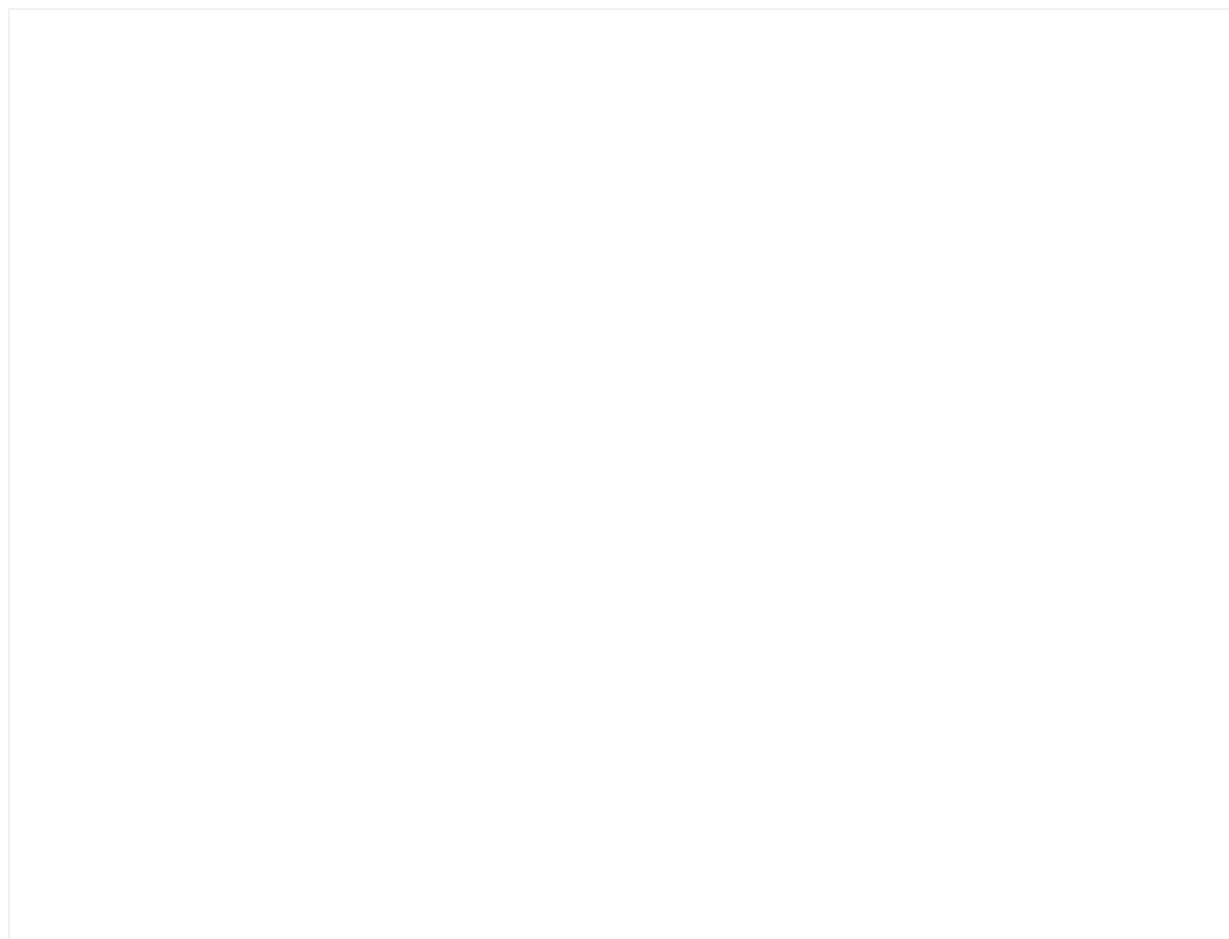
- Step 4. Run the demo.

```
sudo python grove_water_sensor.py
```

- Step 5. We will see the output display on terminal as below.

```
1
1
0
0
1
```

## Schematic Online Viewer



## Resources

- [Eagle] [Grove Water Sensor Schematic](#)
- [Library] [Demo code for Grove Water Sensor](#)
- [Codecraft] [CDC File](#)

